were objected to for certain informalities, claims 15, 17/15, 18/15, 19/18/15, 20, 21/19/15, 22, 25, 27, 29, 31, 33, 35/15, 47, 64, 68, 70, 72, 74, and 76 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Yamakawa et al.* in view of *Japanese Patent Application Publication No. 10-136171* (hereinafter "*JP '171*"), claims 16, 17/16, 18/16, 19/18/16, 21/19/16, 23, 24, 26, 28, 30, 32, 34, 35/16, 48, 65, 69, 71, 73, 75, and 77 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ishigami et al.* in view of *Yamakawa et al.* and *JP '171*, claims 36, 37, 38, 66, and 78 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kanai et al.* in view of *JP '171*, claims 39, 40, 41, 42, 67, and 79 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ishigami et al.* in view of *Kanai et al.* and *JP '171*, and it was noted that claims 43-46, 49-63, and 80-90 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 38, 40, 43, 44, 80, and 84 have been canceled, without prejudice or disclaimer, and claims 15, 16, 26, 27, 28, 36, 39, 45, 46, 49, 50, 53, 54, 59, 61, 63-69, 79, 81, 86, 88, and 90 have been amended.

More particularly, claims 43 and 44 have been canceled, without prejudice or disclaimer, and independent claims 15 and 16 have been amended to include the subject matters of canceled claims 43 and 44, respectively, as the Office Action has already noted would be allowable.

Dependent claims 45 and 46 have been amended to change their dependency from canceled claims 43 and 44, respectively, to claims 15 and 16, respectively. Dependent claims 49 and 50 have been amended to change their dependency from canceled claims 43 and 44, respectively, to claims 15 and 16, respectively.

Further, dependent claims 26, 27, and 28 have been amended to correct informalities in the claim. More particularly, claim 26 was amended to change the term "prescribed write clock frequency" to --prescribed write clock frequencies-- since the term is plural when introduced on lines 5-6 of independent claim 16. Claims 27 and 28 have been amended to change the term "charged " to --changed-- in line 2 of each claim.

In addition, Applicants note that original claims 64 and 65 are basically the same subject matter as original claims 15 and 16, respectively, except that original claims 15 and 16 were written without using means-plus-function language and original claims 64 and 65 were written using means-plus-function language. Therefore, Applicants have amended claims 64 and 65 to include subject matter similar (except in means-plus-function language) to that of canceled claims 43 and 44, respectively, and Applicants respectfully submit that amended claims 64 and 65 should be found allowable for the same reasons that the Office Action has already noted would make amended claims 15 and 16 allowable.

Dependent claim 80 has been canceled, without prejudice or disclaimer, and independent claim 79 has been amended to correct its preamble to be claiming method, instead of apparatus, and to include the subject matter of canceled claim 80 as the Office Action has already noted would be allowable. Further, dependent claim 81 has been amended to change its dependency from canceled claim 80 to amended claim 79.

Further, claim 40 recites the same subject matter of canceled claim 80. Applicants respectfully submit that it is not understood why the Office Action states that claim 80 if rewritten in independent form would be allowable, but does not state that claim 40 if rewritten in independent form would be allowable. Therefore, Applicants have canceled claim 40, without prejudice or disclaimer, and have amended independent claim 39 to include the subject matter of canceled claim 40. Applicants respectfully submit that amended claim

39 should be allowable for the same reason that amended claim 79 is allowable (i.e., that the combination of *Ishigami et al.*, *Kanai et al.*, and *JP '171* do not teach or suggest the limitation that "the prescribed rotation number is changed to a substantially smallest level as color deviation does not occur in a sub-scanning direction).

Further, independent claim 67 has been amended to include subject matter similar to either canceled claim 40 or canceled claim 88 to recite that "the prescribed rotation number is changed to a substantially smallest level as color deviation does not occur in a sub-scanning direction." Since independent claim 67 has only been amended under 35 U.S.C. § 103(a) as being unpatentable over *Ishigami et al.*, *Kanai et al.*, and *JP '171* and the Office Action has already recognized with respect to dependent claim 80 that the combination of *Ishigami et al.*, *Kanai et al.*, and *JP '171* does not teach or suggest that the prescribed rotation number is changed to a substantially smallest level as color deviation does not occur in a sub-scanning direction, it is respectfully submitted that amended claim 67 should be found allowable.

Claims 53 and 54 have been rewritten in independent form to include the subject matters of claims 15 and 16, respectively, as the Office Action has already noted would be allowable.

Claims 59, 61, and 63 have been rewritten in independent format to include the subject matter of claim 15 as the Office Action has already noted would be allowable.

Dependent claim 84 has been canceled, without prejudice or disclaimer, and independent claims 68 and 69 have been amended to include the subject matter of canceled claim 84 as the Office Action has already noted would be allowable. Dependent claims 70 and 71 have been amended to correct a minor typographical error in that the word "bean" in line 2 of each claim has been changed to --beam--.

Dependent claims 86, 88, and 90 have been rewritten in independent form to include all of the limitations of base claim 68 as the Office Action has already noted would be allowable.

Dependent claim 38 has been canceled, without prejudice or disclaimer, and independent claims 36 and 66 have been amended to include the subject matter of canceled claim 38. More particularly, both of independent claims 36 and 66 have been amended to recite that "the temperature of said optical unit is a temperature of said fθ lens" and independent claim 78 already recites that the step of "detecting the temperature of said fθ lens."

As a quick synopsis of the applied prior art references, Applicant hereby repeats the abstracts of *Yamakawa et al.*, *JP '171*, *Ishigami et al.*, and *Kanai et al.*, as follows:

Yamakawa et al. disclose a scanning time after a detection signal from a first laser beam detection sensor is inputted until a detection sensor from a second laser beam detection sensor is inputted by a counter, flip-flops, a corrected write frequency f1 is computed by a control circuit from a value T1 corresponding to the measured scanning time and a function F (T1) for computing a correction factor using the basic write frequency f0 and the value T1 above and through the equation of "f1 = f0 x F (T1)", and the write clock frequency is corrected by a clock generation circuit, thus the write clock frequency being controlled according to a change in the scanning speed.

JP '171 discloses at its problem to be solved: to improve the operating convenience of the user in the case of magnification through fine-adjustment of it in a step of e.g. 0.1% or below. Further, *JP '171* disclose as a solution to its problem to be solved that: Each of 'fine-adjustment zoom mode' and 'magnification correction mode' is selected on a menu of an LCD, the user controls a display menu of the LCD to allow a system controller 302 to

generate a magnification adjustment signal of 0.1% step, and the system controller 302 gives magnification adjustment data to a write drive control circuit 504. The write drive control circuit 504 and a laser driver circuit 502 both change number of revolutions of a polygon mirror and a write clock of a laser diode 503 based on the magnification adjustment data.

Ishigami et al. disclose a color image forming device that can certainly correct uniform velocity error associated with the characteristic of each optical system and can realize high-quality color image printing by performing a fine laser beam irradiating position control, in consideration of an error in surface accuracy of each mirror surface of a rotary polygon mirror. The color image forming device includes a storage unit for holding uniform velocity correction data previously created for each mirror surface of a rotary polygon mirror to correct a distortion in expansion or contraction of the electrostatic latent image in the main scanning direction due to the characteristic of an optical system, and an image clock generating unit for reading uniform velocity correction data on each mirror surface used in the rotary polygon mirror at a scanning time out of the storage unit and then generating image clock pulses for image signal creation with a period corresponding to the uniform velocity correction data. The color image forming device is applicable to printers of electro-photographic systems, electrostatic-recording systems, and the like.

Kanai et al. disclose a copying machine for forming an image by scanning a laser beam which is emitted from an optical system on a photosensitive member. Photosensors are provided at optically equivalent positions to a beginning portion and an end portion of a scanning line on a photosensitive member. A scanning time of a laser beam in the main scanning direction is measured by these photosensors. The measured time and a standard time for a copy magnification set by an operator are compared, and a correction value is calculated, and at the same time, magnification in the main scanning direction is corrected

using the correcting value. Also, focusing (adjusting of the beam diameter) is carried out using the photosensors. Each of the photosensors contains a photoelectric transfer element, and a beam which comes through a slit is incident to the element. Each photosensor is provided with two slits. One is perpendicular to the main scanning direction, and the other is inclined to the main scanning direction. The beam diameter in the main scanning direction is adjusted based on detection of the beam which comes through the slit which is perpendicular to the main scanning direction. The beam diameter in the sub scanning direction is adjusted based on detection of the beam which comes through the slit inclined to the main scanning direction.

None of *Yamakawa et al.*, *JP '171*, *Ishigami et al.*, and *Kanai et al.* teach or suggest, as is now recited in amended independent claims 36 and 66, that the temperature of the optical unit is a temperature of the fθ lens, or as is recited in independent claim 78, the step of detecting the temperature of the fθ lens.

More particularly, the Office Action refers to column 10, lines 55-55, of *Kanai et al.*, wherein it states that "The temperature **around** the fθ lenses 16 and 17 is measured by the temperature sensor 28." (Emphasis added). However, Applicants respectfully point out that *Kanai et al.* is not directly measuring the temperature of the fθ lens as is now being specifically claimed in amended claims 36 and 66, nor the step of detecting the temperature of the fθ lens as is specifically recited in independent claim 78. Rather, as is clear from Fig. 2 of *Kanai et al.*, the temperature sensor (28) is located at some distance from the fθ lenses (16, 17) and therefore, only the temperature **around** the fθ lenses (16, 17) is being measured, not the exact temperature of the fθ lenses (16, 17).

Further, Applicants respectfully submit that *Kanai et al.* and *JP '171* are not combinable in the manner suggested in the Office Action to result in the present invention

absent the impermissible hindsight teachings of the present invention. More particularly, amended independent claims 36 and 66 recite "a magnification correcting device configured to correct magnification error of the light beam in the main scanning direction by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels in accordance with the temperature detected by said temperature detecting device." The Office Action specifically acknowledges that *Kanai et al.* fails to teach the correction of the magnification error being performed by changing the rotation number in accordance with the detected temperature. However, the Office Action alleges that *JP '171* can cure the defect of *Kanai et al.* because it discloses a method for correcting the magnification error in the direction of main scanning by changing both the number of revolutions of the polygon mirror and the write clock of the laser diode based on magnification adjustment data. Applicants respectfully submit that one of ordinary skill in the art would not be motivated to combine *JP '171* with *Kanai et al.* in the manner suggested by the Office Action because *JP '171* has absolutely nothing to do with temperature and therefore, one of ordinary skill in the art seeking to correct magnification error in accordance with detected temperature would not look to *JP '171* since it only teaches changing the number of revolutions based upon magnification adjustment data, but not based upon detected temperature.

Thus, Applicants respectfully submit that amended claims 36 and 66 and unamended claim 78 are not rendered obvious in view of *Kanai et al.* and *JP '171.*

Applicants respectfully submit that the amendments to claims 15, 16, 26, 27, 28, 36, 39, 45, 46, 49, 50, 53, 54, 59, 61, 63-69, 79, 81, 86, 88, and 90 do not add new matter. Applicants also respectfully submit that claims 17-22, 25, 27, 29, 31, 33, 35, 45, 47, 49, and 51 are either directly or indirectly dependent upon amended claim 15 so that arguments serving to patentably distinguish amended claim 15 from the prior art of record are available,

among others, to patentably distinguish claims 17-22, 25, 27, 29, 31, 33, 35, 45, 47, 49, and 51. Applicants also respectfully submit that claims 17-19, 21, 23, 24, 26, 28, 30, 32, 34, 35, 46, 48, 50, and 52 are either directly or indirectly dependent upon amended claim 16 so that arguments serving to patentably distinguish amended claim 16 from the prior art of record are available, among others, to patentably distinguish claims 17-19, 21, 23, 24, 26, 28, 30, 32, 34, 35, 46, 48, 50, and 52. Applicants also respectfully submit that claim 37 is directly dependent upon amended claim 36 so that arguments serving to patentably distinguish amended claim 36 from the prior art of reference are available, among others, to patentably distinguish claim 37. Applicants also respectfully submit that claims 41 and 42 are directly dependent upon amended claim 39 so that arguments serving to patentably distinguish amended claim 39 from the prior art of reference are available, among others, to patentably distinguish claims 41 and 42. Applicants also respectfully submit that claims 55 and 57 are either directly or indirectly dependent upon amended claim 53 so that arguments serving to patentably distinguish amended claim 53 from the prior art or record are available, among others, to patentably distinguish claims 55 and 57. Applicants also respectfully submit that claims 56 and 58 are either directly or indirectly dependent upon amended claim 54 so that arguments serving to patentably distinguish amended claim 54 from the prior art or record are available, among others, to patentably distinguish claims 56 and 58. Applicants also respectfully submit that claim 60 is directly dependent upon amended claim 59 so that arguments serving to patentably distinguish amended claim 59 from the prior art or record are available, among others, to patentably distinguish claim 60. Applicants also respectfully submit that claim 62 is directly dependent upon amended claim 61 so that arguments serving to patentably distinguish amended claim 61 from the prior art or record are available, among others, to patentably distinguish claim 62. Applicants also respectfully submit that claims 70,

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72, 74, and 76 are either directly or indirectly dependent upon amended claim 68 so that arguments serving to patentably distinguish amended claim 68 from the prior art of reference are available, among others, to patentably distinguish claims 70, 72, 74, and 76. Applicants also respectfully submit that claims 71, 73, 75, and 77 are either directly or indirectly dependent upon amended claim 69 so that arguments serving to patentably distinguish amended claim 69 from the prior art of reference are available, among others, to patentably distinguish claims 71, 73, 75, and 77. Applicants also respectfully submit that claims 81, 82, 83, and 85 are either directly or indirectly dependent upon amended claim 79 so that arguments serving to patentably distinguish amended claim 79 from the prior art of reference are available, among others, to patentably distinguish claims 81, 82, 83, and 85. Applicants also respectfully submit that claim 87 is directly dependent upon amended claim 86 so that arguments serving to patentably distinguish amended claim 86 from the prior art or record are available, among others, to patentably distinguish claim 87. Applicants also respectfully submit that claim 89 is directly dependent upon amended claim 88 so that arguments serving to patentably distinguish amended claim 88 from the prior art or record are available, among others, to patentably distinguish claim 89. Based on the foregoing, Applicant respectfully requests withdrawal of the rejection of the claims under U.S.C. § 103(a) based upon any combination of *Yamakawa et al.*, *JP '171*, *Ishigami et al.*, and *Kanai et al.*, and allowance of claims 15-37, 39, 41, 42, 45-79, 81-83, and 85-90.

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New claims 91-102 have been added to claim the invention in varying scope. More particularly, new independent claim 91 = 16 + 59 is a combination of the subject matters of original claims 16 and 59 which the Office Action has already noted would be allowable. New dependent claim 92 is the subject matter of original claim 60 made dependent upon new claim 92. New independent claim 93 is a combination of the subject matters of original

91 = 16 + 59

claims 16 and 61 which the Office Action has already noted would be allowable. New dependent claim 94 is the subject matter of claim 62 made dependent upon new claim 93. New independent claim 95 is a combination of the subject matters of original claims 16 and 63 which the Office Action has already noted would be allowable. New independent claim 96 is a combination of the subject matters of original claims 69 and 86 which the Office Action has already noted would be allowable. New dependent claim 97 is the subject matter of claim 87 made dependent upon new claim 96. New independent claim 98 is a combination of the subject matters of original claims 69 and 88 which the Office Action has already noted would be allowable. New dependent claim 99 is the subject matter of claim 89 made dependent upon new claim 98. New independent claim 100 is a combination of the subject matters of original claims 69 and 90 which the Office Action has already noted would be allowable.

New claim 101 is the same subject matter as original, unamended claim 15 and new claims 102 is the same subject matter as original, unamended claim 25. With respect to new claims 101 and 102, Applicants respectfully traverse the rejection of claims 15, 17/15, 18/15, 19/18/15, 20, 21/19/15, 22, 25, 27, 29, 31, 33, 35/15, 47, 64, 68, 70, 72, 74, and 76 under 35 U.S.C. § 103(a) as being unpatentable over *Yamakawa et al.* in view of *JP '171* for the reasons as follow.

With respect to new independent claim 101, Applicants respectfully submit that neither *Yamakawa et al.* nor *JP '171* teach or suggest "a magnification correcting device configured to correct the magnification error by changing the prescribed write clock frequency and **<u>the prescribed rotation number to prescribed levels based on a result of a comparison between the time difference signal and the reference time difference signal by said comparing device in accordance with the time difference determined by the time</u>**

difference determining device" as is specifically recited in new independent claim 101. This limitation means that the magnification error correction is performed not only by the write clock frequency, but also the rotation number of the light beam deflecting device, and such a correction is performed in accordance with the time difference determined by the time difference determining device.

Although *JP '171* does indeed correct the number of rotations and the write clock frequency, these corrections are achieved both in accordance with a manually set adjusting value so as to adjust current set magnification, and not in accordance with the time difference determined by the time difference determining device as is done by the present invention.

Further, with respect to new dependent claim 102 which is dependent upon new independent claim 101, Applicants respectfully submit that neither *Yamakawa et al.* nor *JP '171* teach or suggest that "said magnification correcting device changes the prescribed rotation number of said light beam deflecting device if the magnification errors cannot completely be corrected only by changing the prescribed write clock frequency," as is specifically recited in new dependent claim 102. More particularly, neither *Yamakawa et al.* nor *JP '171* teach or suggest a technology wherein a rotation speed of the light beam deflecting device is adjusted only when adjustment of the prescribed write clock frequency cannot completely correct the magnification error.

Thus, Applicants respectfully submit that new claims 101 and 102 are not rendered obvious under 35 U.S.C. § 103(a) in view of the combination of *Yamakawa et al.* in view of *JP '171.*

Applicants respectfully submit that new claims 91-102 do not add new matter. Applicants also respectfully submit that new claim 92 is directly dependent upon new claim 91 so that arguments serving to patentably distinguish new claim 91 from the prior art of

record are available, among others, to patentably distinguish new claim 92. Applicants also respectfully submit that new claim 94 is directly dependent upon new claim 93 so that arguments serving to patentably distinguish new claim 93 from the prior art of record are available, among others, to patentably distinguish new claim 94. Applicants also respectfully submit that new claim 97 is directly dependent upon new claim 96 so that arguments serving to patentably distinguish new claim 96 from the prior art of record are available, among others, to patentably distinguish new claim 97. Applicants also respectfully submit that new claim 99 is directly dependent upon new claim 98 so that arguments serving to patentably distinguish new claim 98 from the prior art of record are available, among others, to patentably distinguish new claim 99. Applicants also respectfully submit that new claim 102 is directly dependent upon new claim 101 so that arguments serving to patentably distinguish new claim 101 from the prior art of record are available, among others, to patentably distinguish new claim 102. Based on the foregoing, Applicants respectfully request allowance of new claims 91-102.

In view of the foregoing, claims 15-37, 39, 41, 42, 45-79, 81-83, and 85-102 are believed to be in condition for allowance, and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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IN THE CLAIMS:

Please cancel claims 38, 40, 43, 44, 80, and 84, without prejudice or disclaimer, amend claims 15, 16, 26, 27, 28, 36, 39, 45, 46, 49, 50, 53, 54, 59, 61, 63-71, 79, 81, 86, 88, and 90, and add new claims 91-102, as follows:

15. (Amended) An image forming apparatus[,] comprising:

a light beam generating device configured to generate a light beam;

a light beam modulating device configured to modulate the light beam in accordance with an image signal at a prescribed write clock frequency;

a light beam deflecting device configured to rotate by a prescribed rotation number and deflect the light beam so as to scan an image carrier in a main scanning direction;

a pair of light beam detecting devices configured to detect the light beam, said pair of light beam detecting devices being separately positioned in the main scanning direction;

a time difference determining device configured to determine a time period elapsing from when the light beam is detected by a first of said pair of light beam detecting devices to when the light beam is detected by a second of said pair of light beam detecting devices, said time difference determining device generating a time difference signal at an optional timing of image formation;

a comparing device configured to compare the time difference signal with a reference time difference signal representing preferable magnification so as to recognize magnification error of the light beam in the main scanning direction;

a magnification correcting device configured to correct the magnification error by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels based on a result of a comparison between the time difference signal and the reference time difference signal by said comparing device; and

a visualizing device configured to visualize an image formed on the image carrier after the magnification error is corrected,

wherein said time difference determining device determines a time difference by counting clock pulses after lowering a light beam deflection speed of said light beam deflecting device to a prescribed speed.

16. (Amended) An image forming apparatus for forming a color image by superimposing different mono color images, said image forming apparatus comprising:

a plurality of light beam generating devices configured to generate a plurality of light beams;

a plurality of light beam modulating devices configured to modulate the plurality of light beams in accordance with an applicable mono color image signal at prescribed write clock frequencies;

at least one light beam deflecting device configured to rotate by a prescribed rotation number and deflect the plurality of light beams so as to scan an image carrier in a main scanning direction;

at least one pair of light beam detecting devices configured to detect the plurality of light beams, said at least one pair of light beam detecting devices being separately positioned in the main scanning direction;

a time difference determining device configured to determine a time period elapsing from when the light beam is detected by a first of said at least one pair of light beam detecting devices to when the light beam is detected by a second of said at least one pair of light beam detecting devices, said time difference determining device generating a time difference signal at an optional timing during image formation;

a comparing device configured to compare the time difference signal with a reference time difference signal representing preferable magnification so as to recognize magnification errors of the light beams in the main scanning direction;

a magnification correcting device configured to correct the magnification errors by changing both of the prescribed write clock frequencies of the plurality of light beams and the prescribed rotation number to prescribed levels based on a result of comparison between the time difference signal and the reference time difference signal by the comparing device; and

a visualizing device configured to visualize and superimpose different mono color images formed on the image carrier after the magnification errors are corrected,

wherein said time difference determining device determines a time difference by counting clock pulses after lowering a light beam deflection speed of said at least one light beam deflecting device to a prescribed speed.

26. (Amended) The image forming apparatus according to claim 16, wherein said magnification correcting device changes the prescribed rotation number of said at least one

light beam deflecting device if the magnification errors cannot completely be corrected only by changing the prescribed write clock [frequency] frequencies.

27. (Amended) The image forming apparatus according to claim 25, wherein the prescribed rotation number is [charged] changed when said magnification correcting device executes correction of the magnification errors and a prescribed amount of the magnification errors remain.

28. (Amended) The image forming apparatus according to claim 26, wherein the prescribed rotation number is [charged] changed when said magnification correcting device executes correction of the magnification errors and a prescribed amount of the magnification errors remain.

36. (Amended) An image forming apparatus[,] comprising:

a light beam generating device configured to generate a light beam;

a light beam modulating device configured to modulate the light beam in accordance with an image signal at a prescribed write clock frequency;

a light beam deflecting device configured to rotate by a prescribed rotation number and deflect the light beam so as to scan an image carrier in a main scanning direction;

an optical unit configured to include an fθ lens configured to convert the light beam from substantially a uniform angular speed to substantially a uniform speed;

a temperature detecting device configured to detect temperature of said optical unit;

a magnification correcting device configured to correct magnification error of the light beam in the main scanning direction by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels in accordance with the temperature detected by said temperature detecting device; and

a visualizing device configured to visualize an image formed on the image carrier, wherein the temperature of said optical unit is a temperature of said fθ lens.

38. (Canceled).

39. (Amended) An image forming apparatus for forming a color image by superimposing different mono color images, said image forming apparatus comprising:

a plurality of light beam generating devices configured to generate a plurality of light beams;

a plurality of light beam modulating devices configured to modulate the plurality of light beams, respectively, in accordance with an applicable mono color image signal at a plurality of prescribed write clock frequencies;

at least one light beam deflecting device configured to rotate by a prescribed rotation number and deflect the plurality of light beams so as to scan an image carrier in a main scanning direction;

at least one optical unit configured to include an fθ lens configured to convert the plurality of light beams from substantially the uniform angular speed to substantially the uniform speed;

at least one temperature detecting device configured to detect temperature of the optical unit;

a magnification correcting device configured to correct the magnification errors in the main scanning direction by changing the plurality of write clock frequencies of the plurality of laser beams and the prescribed rotation number of said at least one light beam deflecting device to prescribed levels in accordance with the temperature of said at least one optical unit; and

a visualizing device configured to visualize and superimpose different mono color images formed on the image carrier after the magnification errors are corrected,

wherein the prescribed rotation number is changed to a substantially smallest level as color deviation does not occur in a sub-scanning direction.

40. (Canceled).

43. (Canceled).

44. (Canceled).

45. (Amended) The image forming apparatus according to claim [43] 15, wherein the prescribed speed of the light beam deflection speed is increased to the prior level after the magnification errors, recognized when the light beam deflection speed is lowered, has been corrected.

46. (Amended) The image forming apparatus according to claim [44] 16, wherein the prescribed speed of the light beam deflection speed is increased to the prior level after the magnification errors, recognized when the light beam deflection speed is lowered, has been corrected.

49. (Amended) The image forming apparatus according to claim [43] 15, wherein the light beam deflection speed is lowered only when the time difference is to be detected during image formation.

50. (Amended) The image forming apparatus according to claim [44] 16, wherein the light beam deflection speed is lowered only when the time difference is to be detected during image formation.

53. (Amended) [The] An image forming apparatus [according to claim 15] comprising:

a light beam generating device configured to generate a light beam;

a light beam modulating device configured to modulate the light beam in accordance with an image signal at a prescribed write clock frequency;

a light beam deflecting device configured to rotate by a prescribed rotation number and deflect the light beam so as to scan an image carrier in a main scanning direction;

a pair of light beam detecting devices configured to detect the light beam, said pair of light beam detecting devices being separately positioned in the main scanning direction;

a time difference determining device configured to determine a time period elapsing from when the light beam is detected by a first of said pair of light beam detecting devices to when the light beam is detected by a second of said pair of light beam detecting devices, said time difference determining device generating a time difference signal at an optional timing of image formation;

a comparing device configured to compare the time difference signal with a reference time difference signal representing preferable magnification so as to recognize magnification error of the light beam in the main scanning direction;

a magnification correcting device configured to correct the magnification error by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels based on a result of a comparison between the time difference signal and the reference time difference signal by said comparing device; and

a visualizing device configured to visualize an image formed on the image carrier after the magnification error is corrected,

wherein said light beam deflecting device starts rotating at a low speed when the image formation is commenced, and wherein the time difference is then detected.

54. (Amended) [The] <u>An</u> image forming apparatus [according to claim 16] <u>for forming a color image by superimposing different mono color images, said image forming apparatus comprising:</u>

<u>a plurality of light beam generating devices configured to generate a plurality of light beams;</u>

<u>a plurality of light beam modulating devices configured to modulate the plurality of light beams in accordance with an applicable mono color image signal at prescribed write clock frequencies;</u>

<u>at least one light beam deflecting device configured to rotate by a prescribed rotation number and deflect the plurality of light beams so as to scan an image carrier in a main scanning direction;</u>

<u>at least one pair of light beam detecting devices configured to detect the plurality of light beams, said at least one pair of light beam detecting devices being separately positioned in the main scanning direction;</u>

<u>a time difference determining device configured to determine a time period elapsing from when the light beam is detected by a first of said at least one pair of light beam detecting devices to when the light beam is detected by a second of said at least one pair of light beam detecting devices, said time difference determining device generating a time difference signal at an optional timing during image formation;</u>

<u>a comparing device configured to compare the time difference signal with a reference time difference signal representing preferable magnification so as to recognize magnification errors of the light beams in the main scanning direction;</u>

<u>a magnification correcting device configured to correct the magnification errors by changing both of the prescribed write clock frequencies of the plurality of light beams and</u>

the prescribed rotation number to prescribed levels based on a result of comparison between the time difference signal and the reference time difference signal by the comparing device; and

a visualizing device configured to visualize and superimpose different mono color images formed on the image carrier after the magnification errors are corrected,

wherein said at least one light beam deflecting device starts rotating at a low speed when the image formation is commenced, and wherein the time difference is then detected.

59. (Amended) [The] An image forming apparatus [according to claim 15 or claim 16] comprising:

a light beam generating device configured to generate a light beam;

a light beam modulating device configured to modulate the light beam in accordance with an image signal at a prescribed write clock frequency;

a light beam deflecting device configured to rotate by a prescribed rotation number and deflect the light beam so as to scan an image carrier in a main scanning direction;

a pair of light beam detecting devices configured to detect the light beam, said pair of light beam detecting devices being separately positioned in the main scanning direction;

a time difference determining device configured to determine a time period elapsing from when the light beam is detected by a first of said pair of light beam detecting devices to when the light beam is detected by a second of said pair of light beam detecting devices, said time difference determining device generating a time difference signal at an optional timing of image formation;

a comparing device configured to compare the time difference signal with a reference time difference signal representing preferable magnification so as to recognize magnification error of the light beam in the main scanning direction;

a magnification correcting device configured to correct the magnification error by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels based on a result of a comparison between the time difference signal and the reference time difference signal by said comparing device; and

a visualizing device configured to visualize an image formed on the image carrier after the magnification error is corrected,

wherein a time difference is determined without lowering a light beam deflection speed if the image formation is in progress, and the time difference is compared with a first reference time difference so that only existence of the magnification errors can be recognized.

61. (Amended) [The] An image forming apparatus [according to claim 15 or claim 16] comprising:

a light beam generating device configured to generate a light beam;

a light beam modulating device configured to modulate the light beam in accordance with an image signal at a prescribed write clock frequency;

a light beam deflecting device configured to rotate by a prescribed rotation number and deflect the light beam so as to scan an image carrier in a main scanning direction;

a pair of light beam detecting devices configured to detect the light beam, said pair of light beam detecting devices being separately positioned in the main scanning direction;

a time difference determining device configured to determine a time period elapsing from when the light beam is detected by a first of said pair of light beam detecting devices to when the light beam is detected by a second of said pair of light beam detecting devices, said time difference determining device generating a time difference signal at an optional timing of image formation;

a comparing device configured to compare the time difference signal with a reference time difference signal representing preferable magnification so as to recognize magnification error of the light beam in the main scanning direction;

a magnification correcting device configured to correct the magnification error by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels based on a result of a comparison between the time difference signal and the reference time difference signal by said comparing device; and

a visualizing device configured to visualize an image formed on the image carrier after the magnification error is corrected,

wherein the magnification errors are corrected at a prescribed timing corresponding to an interval of sheets fed to the image carrier.

63. (Amended) [The] An image forming apparatus [according to claim 15 or claim 16] comprising:

a light beam generating device configured to generate a light beam;

a light beam modulating device configured to modulate the light beam in accordance with an image signal at a prescribed write clock frequency;

a light beam deflecting device configured to rotate by a prescribed rotation number and deflect the light beam so as to scan an image carrier in a main scanning direction;

a pair of light beam detecting devices configured to detect the light beam, said pair of light beam detecting devices being separately positioned in the main scanning direction;

a time difference determining device configured to determine a time period elapsing from when the light beam is detected by a first of said pair of light beam detecting devices to when the light beam is detected by a second of said pair of light beam detecting devices, said

time difference determining device generating a time difference signal at an optional timing of image formation;

a comparing device configured to compare the time difference signal with a reference time difference signal representing preferable magnification so as to recognize magnification error of the light beam in the main scanning direction;

a magnification correcting device configured to correct the magnification error by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels based on a result of a comparison between the time difference signal and the reference time difference signal by said comparing device; and

a visualizing device configured to visualize an image formed on the image carrier after the magnification error is corrected,

wherein new sheet feed is stopped when a time difference is substantially different from a reference time difference, and wherein the magnification errors are then corrected.

64. (Amended) An image forming apparatus, comprising:

light beam generating means for generating a light beam;

light beam modulating means for modulating the light beam in accordance with an image signal at a prescribed write clock frequency;

light beam deflecting means for deflecting the light beam for scanning an image carrier in a main scanning direction, said light beam deflecting means rotating by a prescribed rotation number;

a pair of light beam detecting means for detecting the light beam, said pair of light beam detecting means being separately positioned in the main scanning direction;

time difference determining means for determining a time period elapsing from when the light beam is detected by a first of said pair of light beam detecting means to when the

light beam is detected by a second of said pair of light beam detecting means, said time difference determining means generating a time difference signal at an optional timing of image formation;

comparing means for comparing the time difference signal with a reference time difference signal and recognizing magnification errors of the light beam in the main scanning direction, said reference time difference signal representing preferable magnification in the main scanning direction;

magnification correcting means for correcting the magnification errors by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels based on a result of a comparison between the time difference signal and the reference time difference signal by said comparing means; and

visualizing means for visualizing an image formed on the image carrier after the magnification errors are corrected,

wherein said time difference determining means determines a time difference by counting clock pulses after lowering a light beam deflection speed of said light beam deflecting means to a prescribed speed.

65. (Amended) An image forming apparatus for forming a color image by superimposing a plurality of different mono color images, said image forming apparatus comprising:

light beam generating means for generating a plurality of light beams;

light beam modulating means for modulating the plurality of light beams in accordance with an applicable mono color image signal at prescribed write clock frequencies;

light beam deflecting means for deflecting the plurality of light beams for scanning an image carrier in a main scanning direction, said light beam deflecting means rotating by a prescribed rotation number;

a pair of light beam detecting means for detecting the plurality of light beams, said pair of light beam detecting means being separately positioned in the main scanning direction;

time difference determining means for determining a time period elapsing from when the plurality of light beams are detected by a first of said pair of light beam detecting means to when the plurality of light beams are detected by a second of said pair of light beam detecting means, said time difference determining means generating a time difference signal at an optional timing during image formation;

comparing means for comparing the time difference signal with a reference time difference signal representing preferable magnification for recognizing magnification errors of the plurality of light beams in the main scanning direction;

magnification correcting means for correcting the magnification errors by changing both of the prescribed write clock frequencies of the plurality of light beams and the prescribed rotation number to prescribed levels based on a result of comparison between the time difference signal and the reference time difference signal by said comparing means; and

visualizing means for visualizing and superimposing a plurality of different mono color images formed on the image carrier after the magnification errors are corrected,

wherein said time difference determining means determines a time difference by counting clock pulses after lowering a light beam deflection speed of said one light beam deflecting means to a prescribed speed.

66. (Amended) An image forming apparatus, comprising:

light beam generating means for generating a light beam;

light beam modulating means for modulating the light beam in accordance with an image signal at a prescribed write clock frequency;

light beam deflecting means for deflecting the light beam for scanning an image carrier in a main scanning direction, said light beam deflecting means rotating by a prescribed rotation number;

optical means for converting the light beam from substantially a uniform angular speed to substantially a uniform speed, said optical means including an fθ lens;

temperature detecting means for detecting temperature of said optical means;

magnification correcting means for correcting magnification error of the light beam in the main scanning direction by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels in accordance with the temperature detected by said temperature detecting means; and

visualizing means for visualizing an image formed on the image carrier,

wherein the temperature of said optical unit is a temperature of said fθ lens.

67. (Amended) An image forming apparatus for forming a color image by superimposing different mono color images, said image forming apparatus comprising:

light beam generating means for generating a plurality of light beams;

light beam modulating means for modulating the plurality of light beams in accordance with an applicable mono color image signal at a plurality of prescribed write clock frequencies;

light beam deflecting means for deflecting the plurality of light beams for scanning an image carrier in a main scanning direction, said light beam deflecting means rotating by a prescribed rotation number;

optical means for converting the plurality of light beams from substantially a uniform angular speed to substantially a uniform speed, said optical means including an fθ lens;

temperature detecting means for detecting temperature of said optical means;

image magnification correcting means for correcting magnification errors in the main scanning direction by changing the plurality of write clock frequencies of the plurality of laser beams and the prescribed rotation number of said light beam deflecting means to prescribed levels in accordance with the temperature of said optical unit; and

visualizing means for visualizing and superimposing different mono color images formed on the image carrier after the magnification errors are corrected,

wherein the prescribed rotation number is changed to a substantially smallest level as color deviation does not occur in a sub-scanning direction.

68. (Amended) A method for forming an image, said method comprising the steps of:

generating a light beam;

modulating the light beam in accordance with an image signal at a prescribed write clock frequency;

deflecting the light beam by rotating a light beam deflecting device by a prescribed rotation number so as to scan an image carrier in a main scanning direction;

detecting the light beam at separate positions in the main scanning direction;

determining a time period elapsing from when the light beam is detected at a first of the separate positions to when the light beam is detected by a second of the separate positions;

generating a time difference signal at an optional timing of image formation;

comparing the time difference signal with a reference time difference signal representing preferable magnification;

recognizing magnification errors of the light beam in the main scanning direction based on a result of said comparing;

correcting the magnification errors by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels; and

visualizing an image formed on the image carrier after the magnification errors is corrected,

wherein said light beam deflecting device starts rotating at a low speed when the image formation is commenced, and wherein a time difference is then detected.

69. (Amended) A method for forming a color image by superimposing a plurality of different mono color images, said method comprising the steps of:

generating a plurality of light beams;

modulating the plurality of light beams in accordance with an applicable mono color image signal at a plurality of prescribed write clock frequencies;

deflecting the plurality of light beams by rotating a light beam deflecting device by a prescribed rotation number so as to scan an image carrier in a main scanning direction;

detecting the plurality of light beams at separate positions in the main scanning direction;

determining a time period elapsing from when the plurality of light beams are detected at a first of the separate positions to when the plurality of light beams are detected at a second of the separate positions;

generating a time difference signal at an optional timing during image formation;

comparing the time difference signal with a reference time difference signal representing preferable magnification;

recognizing magnification errors of the plurality of light beams in the main scanning direction based on a result of said comparing;

correcting the magnification errors by changing both of the plurality of prescribed write clock frequencies of the plurality of light beams and the prescribed rotation number to prescribed levels; and

visualizing and superimposing different mono color images formed on the image carrier after said correcting the magnification errors is executed,

wherein said light beam deflecting device starts rotating at a low speed when the image formation is commenced, and wherein a time difference is then detected.

70. (Amended) The method according to claim 68, wherein said correcting the magnification errors includes changing the prescribed rotation number of said light [bean] beam deflecting device if the magnification errors cannot completely be corrected only by changing the prescribed write clock frequency.

71. (Amended) The method according to claim 69, wherein said correcting the magnification errors includes changing the prescribed rotation number of said light [bean] beam deflecting device if the magnification errors cannot completely be corrected only by changing the plurality of prescribed write clock frequencies.

79. (Amended) A method for forming a color image by superimposing different mono color images, said [image forming apparatus] method comprising the steps of:

generating a plurality of light beams;

modulating the plurality of light beams in accordance with an applicable mono color image signal at a plurality of prescribed write clock frequencies;

deflecting the plurality of light beams by rotating a light beam deflecting device by a prescribed rotation number so as to scan an image carrier in a main scanning direction;

converting the plurality of light beams using an fθ lens from substantially a uniform angular speed to substantially a uniform speed;

detecting temperature of said fθ lens;

correcting the magnification errors in the main scanning direction by changing a plurality of write clock frequencies of the plurality of laser beams and the prescribed rotation number of said light beam deflecting device to prescribed levels in accordance with the temperature detected in said detecting temperature of said fθ lens; and

visualizing and superimposing different mono color images formed on the image carrier after the magnification errors are corrected,

<u>wherein the prescribed rotation number is lowered to substantially a smallest level as color deviation does not occur in a sub-scanning direction</u>.

80. (Canceled).

81. (Amended) The method according to claim [80] <u>79</u>, wherein the substantially smallest level is increased to a prior level after the magnification errors, recognized when a light beam deflection speed is lowered, has been corrected.

84. (Canceled).

86. (Amended) [The] <u>A</u> method [according to claim 68 or claim 69] <u>for forming an image, said method comprising the steps of:</u>

<u>generating a light beam;</u>

<u>modulating the light beam in accordance with an image signal at a prescribed write clock frequency;</u>

deflecting the light beam by rotating a light beam deflecting device by a prescribed rotation number so as to scan an image carrier in a main scanning direction;

detecting the light beam at separate positions in the main scanning direction;

determining a time period elapsing from when the light beam is detected at a first of the separate positions to when the light beam is detected by a second of the separate positions;

generating a time difference signal at an optional timing of image formation;

comparing the time difference signal with a reference time difference signal representing preferable magnification;

recognizing magnification errors of the light beam in the main scanning direction based on a result of said comparing;

correcting the magnification errors by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels; and

visualizing an image formed on the image carrier after the magnification errors is corrected,

wherein a time difference is determined without lowering the light beam deflection speed if the image formation is in progress, and wherein a time difference is compared with a first reference time difference so that only existence of the magnification errors can be recognized.

88. (Amended) [The] A method [according to claim 68 or claim 69] for forming an image, said method comprising the steps of:

generating a light beam;

modulating the light beam in accordance with an image signal at a prescribed write clock frequency;

deflecting the light beam by rotating a light beam deflecting device by a prescribed rotation number so as to scan an image carrier in a main scanning direction;

detecting the light beam at separate positions in the main scanning direction;

determining a time period elapsing from when the light beam is detected at a first of the separate positions to when the light beam is detected by a second of the separate positions;

generating a time difference signal at an optional timing of image formation;

comparing the time difference signal with a reference time difference signal representing preferable magnification;

recognizing magnification errors of the light beam in the main scanning direction based on a result of said comparing;

correcting the magnification errors by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels; and

visualizing an image formed on the image carrier after the magnification errors is corrected,

wherein the magnification errors are corrected at a prescribed timing corresponding to an interval of sheets fed to the image carrier.

90. (Amended) [The] A method [according to claim 68 or claim 69] for forming an image, said method comprising the steps of:

generating a light beam;

modulating the light beam in accordance with an image signal at a prescribed write clock frequency;

deflecting the light beam by rotating a light beam deflecting device by a prescribed rotation number so as to scan an image carrier in a main scanning direction;

detecting the light beam at separate positions in the main scanning direction;

determining a time period elapsing from when the light beam is detected at a first of the separate positions to when the light beam is detected by a second of the separate positions;

generating a time difference signal at an optional timing of image formation;

comparing the time difference signal with a reference time difference signal representing preferable magnification;

recognizing magnification errors of the light beam in the main scanning direction based on a result of said comparing;

correcting the magnification errors by changing the prescribed write clock frequency and the prescribed rotation number to prescribed levels; and

visualizing an image formed on the image carrier after the magnification errors is corrected,

wherein new sheet feed is stopped when a time difference is substantially different from a reference time difference, and wherein the magnification errors are then corrected.

91-102. (New).